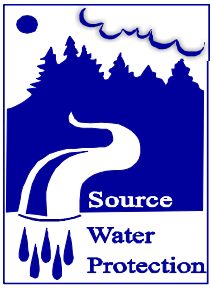
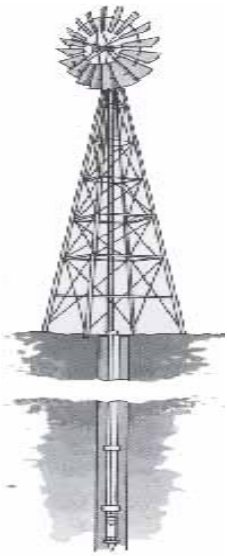
MONTANA SOURCE WATER PROTECTION

July 2007

Montana Department of
ENVIRONMENTAL QUALITY



THE SOURCE WATER PROTECTION PROGRAM of the Montana Department of Environmental Quality prepared this informational booklet. For more information about the program in Montana, contact the Source Water Protection Program at 444-6697.



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Introduction
Source Water Protection Program

The Federal Safe Drinking Water Act (SDWA) requires states to develop and implement a Source Water Assessment Program (SWAP) that analyzes existing and potential threats to the quality of the drinking water of public water supplies throughout the state. The Montana SWAP was formally approved by the U.S. Environmental Protection Agency (EPA) in November of 1999.

What is a Public Water Supply System?

According to Federal and Montana regulations, a ***public water supply*** is a system that supplies water for human consumption and has at least 15 service connections or regularly provides water to at least 25 persons daily for a minimum of 60 days in a calendar year. There are three classes of public water supply systems: community, non-transient non-community, and transient non-community.

- **Community water systems** provide water on a year-round basis and have a minimum of 15 service connections or regularly serve at least 25 residents. In addition to incorporated towns, community systems may serve smaller areas such as housing subdivisions or trailer courts.

- **Non-transient non-community systems** do not serve communities, but provide water regularly to a minimum of 25 of the same people for at least six months of a year. These systems serve buildings, such as schools, hospitals, and businesses where people are employed but do not reside.

- **Transient non-community systems** do not serve communities and do not regularly serve a minimum of 25 of the same people for at least six months of the year. These systems are usually seasonal and serve facilities in areas such as campgrounds, parks, rural motels, and cafes.

What is Source Water?

Source water is untreated water from streams, rivers, lakes, or aquifers used to supply public drinking water. Ensuring that source water is protected from contamination can reduce the costs of treatment and risks to public health.

Source Water Protection

Source water protection is a common sense approach to guarding public health by protecting drinking water supplies at the water source, providing public health protection and reducing the treatment challenge for public water suppliers.

Protecting source water is an active step towards safe drinking water.

In some cases, source water protection can eliminate or forestall the need to change or modify treatment processes, saving consumers significant amounts of money.

In the past, water suppliers using surface waters had a tendency to focus most of their resources on filtration and disinfection to meet drinking water standards. Systems using ground water assumed or hoped their source would remain pure. Today we employ source water protection as a means to prevent contamination, reducing the need for treatment of drinking water supplies. Through source water protection communities can take positive steps to manage potential sources of contaminants and develop a contingency plan by identifying alternate sources of drinking water.

Protecting source water is an active step towards safe drinking water. A Source Water Protection Plan (SWPP), along with treatment (if necessary) are both important for a community's drinking water supply. A community may decide to develop a SWPP based on the results of a source water assessment that includes the delineation and an inventory of the potential contaminants of the area.

Threats to Source Water

Contaminants that may be present in source water before it is treated include:

- **Microbial contaminants** such as viruses and bacteria may come from sewage treatment plants, septic systems, livestock operations, and wildlife.

- **Inorganic contaminants** such as salts and metals can occur naturally or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

- **Pesticides and herbicides** may come from a variety of sources such as agriculture, storm water runoff, and residential uses.

- **Organic contaminants**, such as volatile chemicals (solvents), can come from gas stations, repair shops, and certain other businesses.

Montana's SWP Program and Local Source Water Protection Efforts

The state's approach to source water protection was developed to help guide local protection efforts. The Department of Environmental Quality (DEQ) is responsible for the Source Water Protection Program (SWPP) in Montana.

The Source Water Protection staff performs assessments for water systems in Montana. Each assessment must include these four major elements:

- Delineating (or mapping) the source water assessment area;
- Conducting an inventory of potential sources of contamination in the delineated area;
- Determining the susceptibility of the water supply to those contamination sources; and
- Releasing the results of the determinations to the public.

These source water assessments have been completed for most of the water systems in the state. Following the assessments described above, DEQ's Source Water Protection Program provides help to water systems to develop and implement practical source water protection planning and activities.

Missouri River

Communities and the Source Water Protection Plan

Source Water Protection Plan (SWPP) allows a community to take an active role in working together to protect public health and the environment. Communities often take for granted a plentiful supply of high quality drinking water; however, drinking water from ground water, surface water, or both, can be vulnerable natural resources that need protection. Unprotected drinking water sources can result in contamination, possibly causing health problems, and significant expense to the community. Cleaning up a drinking water contamination incident is a complicated, costly, and sometimes impossible process.

SWPPs can protect both ground water and surface water supplies. Although the technical aspects differ for ground water and surface water sources because of differing hydrology and hydrogeology, the concept is the same: prevent contamination from traveling through the ground or water and into the drinking water. Every community depends on safe drinking water, therefore, protecting it should be a local priority. Developing a SWPP allows communities to actively protect public health rather than having to react after a problem occurs.

Costs of preventing contamination are small compared to cleaning up contamination sites.

Some communities may be concerned that a SWPP would be too expensive. When compared to the costs of cleaning up after a contamination incident, the costs of preventing contamination are very small. Installing treatment facilities, locating new drinking water sources, constructing new systems (i.e., new wells or intakes), and cleaning up contamination sites are all expensive. Costs incurred by contamination could include decreased property values, loss of tax base, and loss of citizen's confidence in their drinking water, public utilities, and community leaders.

Communities and the Source Water Protection Plan - *continued*

On the other hand, developing a source water protection plan can empower the community and may also make a water system eligible for money saving opportunities. For example, if a SWPP is in place, water systems may receive a waiver for specific water testing or treatment requirements, preventing some potentially expensive chemical sampling or treatment of the water supply.

If a Source Water Protection Plan is in place, water systems may receive a waiver for specific water testing.

Philipsburg, MT

Overview of Montana's Source Water Protection Program

Source Water Protection Planning is divided into two components: 1) a technical component that has been completed by a qualified hydrologist or hydrogeologist, and 2) a non-technical component that is developed by the community working together with SWP staff or other assistance providers. The different components are summarized as follows:

Technical Component – This is the completed assessment report.

- **Delineation** – Identifies the hydrogeologic setting of the drinking water source.
- **Assessment** – Identifies and evaluates ***potential*** sources of contamination to the drinking water source.

Non-Technical Component – Completed Source Water Protection Plan with components developed by communities to reflect local resources and personnel:

- **Management Plan** – Preserving the integrity of a drinking water source.
- **Emergency Plan** – Lists procedures for emergency response that can threaten a water source.
- Identify an **alternate water source.**

SOURCE WATER DELINEATION AND ASSESSMENT REPORT
Stockett Water and Sewer District • PWSID # 00579
Report Date: June 29, 2007
Beverly J. Pepos • Certified Operator
P.O. Box 121 • Stockett, MT 59480

Technical Components:

Delineation

Delineation is a process that identifies ground water flow to a well or stream flow to a surface water intake. The results are displayed on a map as a source water protection area and are usually subdivided into management regions (see figures on pages 14–16).

Assessment

The susceptibility ***assessment*** assigns a relative hazard to each inventoried potential contaminant source based on location, relative toxicity, and concentration. The hazard is weighed against barriers to obtain a final susceptibility assessment that reflects the potential for each source to contaminate the public water supply source. Barriers may be: natural (continuous clay layer or thick clay-rich soils), engineered (secondary containment for chemical handling areas), or management actions (e.g. community education, water quality protection practices or a local ordinance).

The goal of the program is to ***collect information*** for the community, thereby helping local management and officials understand the water source and consider future planning efforts.

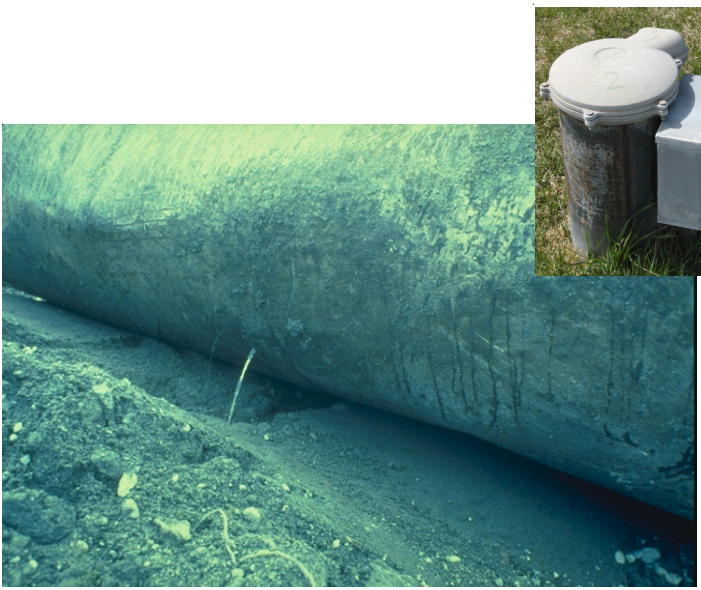
Examples of Significant Potential Contaminant Sources	
Septic Systems	Landfills
Animal Feeding Operations	Abandoned Mines
Underground Storage Tanks	MPDES Wastewater Discharges
Leaking Underground Storage Tanks	Sanitary Sewer
State and Federal Superfund Sites	Storm Sewers
RCRA Large Quantity Generators	Storm Water Discharges
Class V Injection Wells	Highways, Railroads and Pipelines
Wastewater Treatment/ Spray Irrigation / Lagoons	Cultivated Cropland

Non-Technical Components:

Management Plans

A ***management plan*** describes the approach a community is using to protect the drinking water; it does not have to mean more government regulations. While some communities have enacted local ordinances for protection of drinking water sources, others rely on community education and awareness as an effective approach. The level of effort in a management plan should be based on site-specific needs.

For example, a leaking underground fuel tank near a PWS well may need an emergency response while a similar leaking tank located several thousand feet upgradient may simply require remediation planning and monitoring.



Leaking Underground Storage Tank

Ground Water System
Non-Regulatory Management Plan

Control Zone (100-foot radius around wellhead)

- No chemicals are used, stored or transported within 100 feet of the well(s). Zone is controlled by PWS.

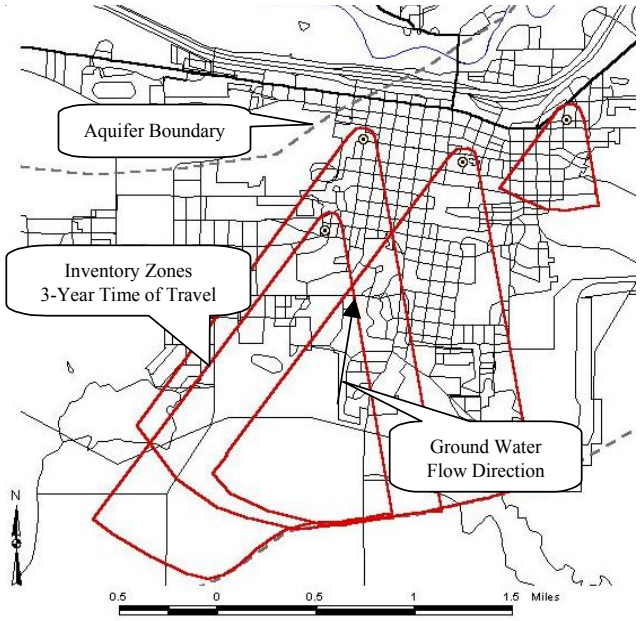
Inventory Zone

- Pollution prevention planning and education is provided to the community.
- PWS operator has training and materials available to clean up any small chemical or petroleum fuel spills. A list of emergency responders is available for large spills.
- Spill containment is required in areas where chemicals are stored and handled.
- Waste chemicals are collected and properly disposed or recycled; disposal of waste chemicals on the ground is prohibited.
- Sewer lines are regularly monitored for leaks and promptly repaired if/when detected.

Management Regions for Community PWSs – Ground Water Systems

SWAP Regions	Delineation Methods	Delineation Minimum Criteria
Control	Fixed Radius	100 feet from wellhead.
Inventory	Analytical Method	Larger of 1,000 feet upgradient, or 3-year time of travel (largest distance). Connected to Surface Water – Establish Surface Water Buffer Zone (same criteria as Spill Response Zone for Surface Water Systems).
Recharge	Hydrogeologic Mapping	Physical and hydrologic flow boundaries.

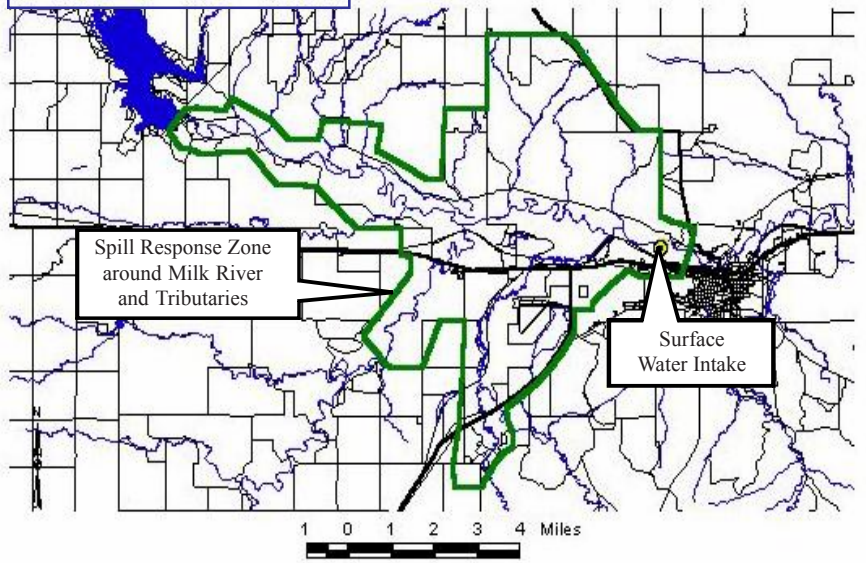
NOTE: The inventory zone is a fixed 1,000-foot radius around the wellhead for confined aquifers.



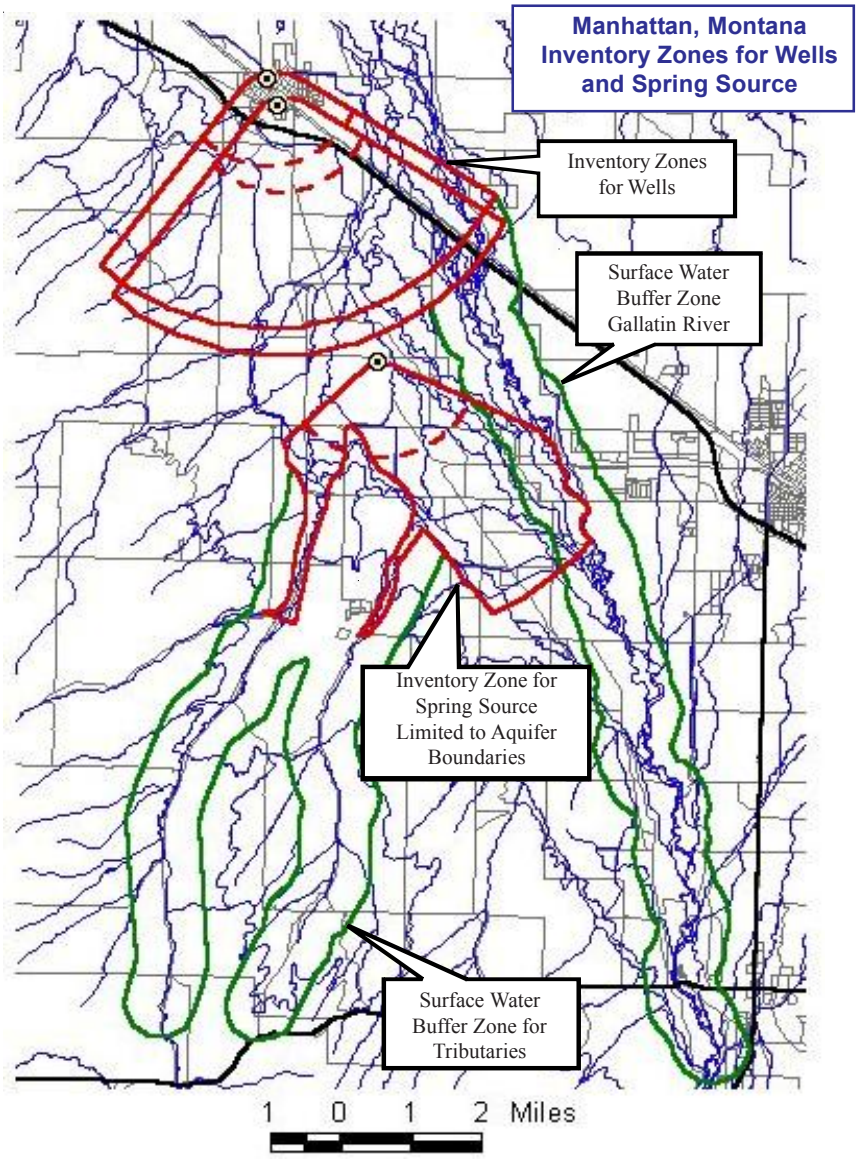
Management Regions for a Community PWS – Surface Water Systems

SWAP Regions	Delineation Methods	Delineation Minimum Criteria
Spill Response	Fixed Distance	½ mile wide buffer extending upstream 10 miles or 4-hour time of travel (largest distance).
Watershed	Hydrogeologic Mapping	Boundary of one of four major watershed regions in Montana.

Havre, Montana
Spill Response Zone for Surface Water Intake



Management Regions for Community PWSs – Ground Water Systems in Shallow Alluvial Aquifers in Communication with Surface Water



Emergency Plans

Emergency plans identify procedures to respond to a chemical spill or other unknown threat that can impact a water supply source. An emergency plan should take a "what if" approach that reflects a worst-case scenario such as a pipeline or tanker truck spill. With an emergency plan in place, a community will have a plan to quickly respond to any unforeseen situation that can threaten a water source.

Alternate Water Sources

An ***alternate water source*** is usually identified for development in case the original water source becomes unusable. Identification of a possible well site for future use can be a result of the technical report. A PWS may want to take formal steps to protect an alternate well field from nearby development that would cause a hazard to the ground water, saving time and expense at a later date.

An emergency plan identifies:

- Emergency coordinator;
- Procedures to follow to shut down a well;
- Procedures to follow and any equipment needed to respond to a spill;
- Method to communicate with water users;
- A source of emergency water for users.

Conclusion

The Source Water Delineation and Assessment Report summarizes the information gathered, helping communities understand the potential threats to their water supplies and identify priority needs for protecting the water from contamination.

The delineation and assessment reports are available to the public by contacting the Source Water Protection Program at 444-6697, the certified operator of a water supply, or the internet at http://nris.state.mt.us/wis/swap/swapquery.asp.

The results of the assessments are also included in the annual water quality report that community water systems are required to prepare for their customers. Community groups can hold local meetings to discuss the results, begin the process of protecting the drinking water source, and consider possible alternate water sources.

Community groups and local officials, working in cooperation with local, regional, and state government agencies can plan how to manage identified potential contamination sources and prevent new contaminant threats in the source water assessment area.

Communities can use different source water protection methods to prevent contamination of their drinking water.

Communities can use many different source water protection methods to prevent contamination of their drinking water supplies. One management option is a local ordinance, such as prohibiting or restricting land uses that may release contaminants in critical source water areas.

Along with regulations, communities can distribute information to educate and encourage citizens and businesses to recycle, limit their use of pesticides, participate in watershed cleanup activities, and use other prevention activities.

Conclusion – *continued*

Another aspect of a source water protection program can be the purchase of land or the creation of conservation easements to serve as a protection zone near the drinking water source. For an effective protection program, communities can consider using a variety of prevention measures.

Photo by Montana Water Center

Ground Water
and
Drinking Water

Questions to get started:

1. Do you know the location of the wells serving your PWS?
2. Do your wells tap an aquifer in a highly sensitive hydrogeologic setting?
3. How far away does water travel to your wells over a three-year period?
4. Has your water system experienced regulated contaminant detection?
5. Are there sources of regulated contaminants located near your wells with the potential of contaminating your drinking water?
6. How much does a PWS well cost?
7. Should the community or PWS develop a management plan to ensure long-term water quality?